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MS APPEAL BRIEF - PATENTS
PATENT
3672-0109P

IN THE U.S. PATENT AND TRADEMARK OFFICE

In re application of		Before the Board of Appeals	
Thomas EBBESEN, et al.		Appeal No.:	
Appl. No.:	09/720,084	Group:	2877
Filed:	December 20, 2000	Examiner:	K. KIANNI
Conf.:	6979		
For:	APPARATUS COMPRISING ELECTRONIC AND/OR OPTOELECTRONIC CIRCUITRY AND METHOD FOR REALIZING SAID CIRCUITRY		

APPEAL BRIEF TRANSMITTAL FORM

MS APPEAL BRIEF - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

June 7, 2004
(First Business day after June 5, 2004)

Sir:

Transmitted herewith is an Appeal Brief (in triplicate) on behalf of the Appellants in connection with the above-identified application.

☐ The enclosed document is being transmitted via the Certificate of Mailing provisions of 37 C.F.R. § 1.8.

A Notice of Appeal was filed on April 5, 2004.

☐ Applicant claims small entity status in accordance with 37 C.F.R. § 1.27

The fee has been calculated as shown below:

☐ Extension of time fee pursuant to 37 C.F.R. §§ 1.17 and 1.136(a) - $0.00.

☒ Fee for filing an Appeal Brief - $330.00 (large entity).

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☐ Please charge Deposit Account No. 02-2448 in the amount of $0.00. A triplicate copy of this sheet is attached.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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Attachment(s)

(Rev. 02/08/2004)

Appl No: 09/720,084
Attorney Docket: 3672-0109P

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Thomas EBBESEN et al.	Appeal No.:
Appl No:	09/720,084	Art Unit: 2877
Filed:	December 20, 2000	Examiner: K. KIANNI
For:	APPARATUS COMPRISING ELECTRONIC AND/OR OPTOELECTRONIC CIRCUITRY AND METHOD FOR REALIZING SAID CIRCUITRY	

APPEAL BRIEF ON BEHALF OF APPELLANT: Thomas EBBESEN et al.

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

June 7, 2004
(first business day
after June 5, 2004)

Sir:

This appeal is from the decision of the Examiner dated November 3, 2003 finally rejecting claims 2-32 and 35-42, which are reproduced as an Appendix to this brief.

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I. Real Party in Interest

The real party in interest is Thin Film Electronics ASA of Norway.

II. Related Appeals and Interferences

There are no other appeals or interferences that will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. Status of Claims

Claims 2-32 and 35-42 are pending in this application and are subject of this appeal.[1] Claims 1, 34, and 43-54 have been withdrawn from consideration and claim 33 has been canceled.

IV. Status of Amendments

No new amendment has been submitted after final.

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[1]Claims 55-56 have been improperly withdrawn from consideration by the Examiner. These claims were added as a matter of right in the Rule 111 Reply filed on August 6, 2003.

V. Summary of the Invention

The present invention relates to electronic and/or optoelectronic circuitry that is realized in a fabric-like structure. In other words, the circuitry pattern may be accomplished by integrating circuitry elements using weaving, knitting, crocheting, knotting, stitching, etc. The circuitry elements may be strand-like and include wires, fibers, ribbons, strips, multicomponent filaments, or combinations thereof. The circuitry may be manufactured in two or three dimensions.

In conventional electronic circuitry, the substrate plays a dominating role. In traditional silicon-based technologies, the electronic functionality is derived from the semiconducting silicon substrate, which severely restricts opportunities for extensions into the third dimension. Furthermore, physical dimensions are restricted, and the traditional lithographic processes provide only limited flexibility with respect to intra-device connectivity. This includes both the physical characteristics of the connecting lines themselves and how they can be positioned throughout the device structures. Typically, the substrate and its layered superstructures contain electrical interconnects where electric currents flow in patterned

conducting paths that have been created by subtractive or additive processes.

Typically, modern microelectronic circuits involve multiple step lithography processes where images of the circuitry are transferred to the substrate. This requires careful registry between each step, the more so as the features become smaller and smaller. The substrate must be extremely flat and rigid. Furthermore, the circuitry cannot be continuous through this approach. Several chips have to be made individually. In addition, the integration of electronic and optoelectronic circuits is extremely difficult by such methods.

The embodiments of the present invention address one or more of these issues. In an embodiment of the present invention, an electronic circuit - a web of circuitry - includes at least two circuit elements each having ends. The two circuit elements intersect physically, but the intersection does not occur at the ends of the elements. The elements are arranged in a predetermined pattern by integrating the elements using weaving, knitting, crocheting, knotting, or stitching, or combinations thereof.

The elements may be formed from wires, fibers, ribbons, strips, multicomponent filaments, or combinations thereof. *See specification, page 5, lines 5-7.* The elements may have conducting, superconducting, semiconducting, or insulating properties. *See specification, page 9, lines 1-2.*

The elements may be in the form of strands, wherein the individual strands may be made to include several different materials and substructures. For example, multiconductor cables and/or metallic filaments may be cladd with polymers, the combination of which exhibit electrical and/or optical properties when brought into contact with other components. The materials and substructures may also be used for sensing the environment. *See specification, page 9, lines 6-13.*

The circuitry may be formed in a fabric-like structure through weaving, knitting, crocheting, knotting, and/or stitching processes. Such processes also allow two or three dimensional structures to be achieved. *See e.g. Figures 1a-1e, 2a-2e, 3a-3d, etc. of the present disclosure.* The strands may be as long or as short as required, and the circuitry may be physically flexible. *See specification, page 9, lines 14-33.* Examples of fabric-like structures are shown in Figures 1a - 3d of

the present disclosure. It is to be noted that the strands are interlaced with one another. In other words, a strand does not occupy a particular layer.

The strands may be laid in a predetermined circuit pattern to perform different functions. For example, the pattern may be arranged to form a loop detector or a pile sensor. *See specification, page 11, lines 9-14; Figures 5 and 6.* The strands themselves may be pre-made prior to incorporating them into fabric-like structures to incorporate desired properties such as suppressing cross-talk. *See specification, page 14, lines 27-34.*

The strands may be ultra-thin transmission lines, which include twisted pair conductors, coaxial line conductors, stripline conductors, flat conductor pairs, etc. *See specification, page 15, line 8 - page 16, line 26; Figures 10a - 10e.* The fabric-like structures may also form flexible rolled-up devices. *See specification, page 16, line 27 - page 17, line 33.* The fabric-like structures may undergo further processing to achieve the desired characteristics. *See specification, page 19, page 21 - page 20, line 25.*

VI. Issues

The following are the issues presented for appeal:

- Whether claims 2-7, 9-20, 30, and 35-42 (hereinafter "Group 1 claims") are properly rejected under 35 U.S.C. §103(a) as being unpatentable over Gudesen et al. (WO 99/14762, hereinafter "Gudesen")[2];
- Whether claims 8 and 21-29 (hereinafter "Group 2 claims") are properly rejected under 35 U.S.C. §103(a) as being unpatentable over the combination of Gudesen and Lebby[3] et al. (U.S. Patent No. 5,906,004, hereinafter "Lebby") (*see below*); and
- Whether claims 31 and 32 (hereinafter "Group 3 claims") are properly rejected under 35 U.S.C. §103(a) as being unpatentable over the combination of Gudesen and Wiener (U.S. Patent No. 5,524,679).

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[2] The invention described in Gudesen is owned by the Assignee of the present application - Thin Film Electronics ASA of Norway. Gudesen is directed to a wholly different subject matter than the present application.

[3] Regarding the rejection of Group 2 claims, the Examiner initially indicated that the claims are rejected based on a combination of Gudesen and Alton (U.S. Patent No. 4,521,771). *See Final Office Action, page 7, lines 9-10*. However, the Examiner actually referred to Lebby in his detailed discussions. *See e.g. Final Office Action, page 8, lines 11-21*. Specific line numbers referenced more closely align with Lebby than Alton. Therefore, Applicants are treating the Group 2 claims as being rejected based on a combination of Gudesen and Lebby.

We are appealing the rejection at this time since our efforts to simplify the issue(s) before the Examiner have been unsuccessful. Despite a detailed Rule 111 Reply (filed on August 6, 2003) in response to the First Office Action (dated May 6, 2003), the Examiner merely repeated his rejections of the First Office Action in the Final Office Action (dated November 3, 2003). Even in the "Response to the Argument and Amendment" section of the Final Office Action, the Examiner merely repeated the same assertions for rejection as he had in the First Office Action. *See Final Office Action, pages 9-10.* In other words, the Examiner failed to adequately address each and every traversal arguments presented.

As the record reflects, Applicants' Representative made multiple request for interviews (April 12, 2004; March 11, 2004; and December 15, 2003) in an attempt to come to an understanding of the issues with the Examiner. When the Interview Request Form (PTOL 413-A) was first submitted on December 15th, the Examiner replied that more details were required.[4] This was

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[4] The Examiner never contacted the Examiner's representative to confirm receipt of the form and to schedule the interview. The Examiner verbally required more details only after being contacted by the Applicants' representative.

despite the plain language of the form clearly specifying that only a "Brief Description" is required.

In another attempt to promote the progress of the prosecution, the Representative submitted another PTOL-413A on March 11th and submitted attachments to indicate the motivations behind the interview request. The Examiner denied the interview request.

The Notice of Appeal was then filed on April 5, 2004. After the Notice of Appeal was filed, the Examiner contacted the Representative and requested a new PTOL-413A be submitted. The Representative did so to be cooperative and provided details of the issues to be discussed in the PTOL-413A form submitted on April 12th.

When the Representative followed up to determine the status, the Examiner replied that the interview request is denied because it was his determination that no new issues were presented. In effect, the Examiner refused to avail himself of the opportunity to clarify the issues and generally promote the prosecution of the application.

Applicants apologize for essentially requesting the Board to perform the function of examining the application. However,

because it appeared that no further progress could be made with the Examiner, Applicants proceeded with the appeal process.

VII. Grouping of Claims

A. Group 1 Claims

Claims of Group 1 do not stand or fall together. In this group, claim 35 is independent. As will be demonstrated below, Gudesen may not be relied upon to teach or suggest all features of the independent claim 35.

In addition, Gudesen may not be relied upon to teach or suggest features recited in claims 2-7, 9-20, 30, and 36-42.

B. Group 2 Claims

Claims of Group 2 do not stand or fall together. Gudesen and Lebby may not be properly combined to teach or suggest all features of claims 8 and 21-29.

C. Group 3 Claims

Claims of Group 3 do not stand or fall together. Gudesen and Wiener may not be properly combined to teach or suggest all features of claims 31 and 32.

VIII. Arguments

A. Group 1 Claims

1. Weaving, Knitting, Crocheting, Knotting, or Stitching Cannot Be Incorporated into Gudesen

For a Section 103 rejection to be valid, the Examiner must establish a *prima facie* case of obviousness. *See M.P.E.P. 2142.* One requirement to establish a *prima facie* case of obviousness is that the prior art references must teach or suggest **all claim limitations**. *Emphasis added; see M.P.E.P. 2142; M.P.E.P. 706.02(j).* Thus, if a cited reference fails to teach or suggest one or more elements, the rejection is improper and must be withdrawn.

In this instance, independent claim 35 recites, in part, "wherein said elements are arranged in said predetermined circuit pattern by integrating said elements using **weaving, knitting, crocheting, knotting, or stitching**". *Emphasis added.* **The Examiner admitted that such a feature is not taught in Gudesen**. *See Final Office Action, page 4, lines 15-16.* However, the Examiner asserted that it would have been obvious to use "the well-known techniques of weaving, knitting, crocheting,

knotting, or stitching." *See Final Office Action, page 4, line 22 - page 5, line 3.*

Such an assertion is without merit. The Examiner failed to provide any support to demonstrate that such techniques are well-known. The Examiner also failed to indicate the manner in which weaving, knitting, crocheting, knotting, or stitching techniques could be incorporated into the devices of Gudesen.

More specifically, Gudesen is directed to a Read Only Memory (ROM) device wherein memory material is provided between a horizontal set (x set) of electrodes 4 and a vertical set (y set) of electrodes 2 on substrates 3 and 1. The electrodes within each set are parallel to each other and the x and the y sets of electrodes cross each other orthogonally. *See Gudesen, Figure 3a.*

A memory material 9 is provided between the x and y sets of electrodes either as a global layer (*e.g. see Gudesen, Figure 3b - shown as memory material 9*) or as patches at the electrode crossings (*e.g. see Gudesen, Figure 4c - shown as patches 10 of memory material*). Memory cells 5 are formed at the crossings between the x and y sets of electrodes 4 and 2. *See Gudesen, Figure 3a.*

Encoding of data onto the memory cells 5 is permanent and takes place by leaving the memory material 9, 10 in the memory cell in contact with the crossing electrodes 4 and 2 (to represent a binary logical value) or by preventing electrical communication between the crossing electrodes 4 and 2 at the memory cell 5 (to represent the other binary logical value). To prevent electrical communication between the crossing electrodes at a particular memory cell 5, the memory material 9 may be insulated through an isolator patch 7 (*e.g. see Gudesen, Figure 3b*) or the isolator patch 7 may completely occupy the memory cell location (*e.g. see Gudesen, Figure 3c*).

It is important to note the following. In the formation of the ROM, the x and y sets of electrodes 4 and 2 are deposited and etched **on a layer-by-layer basis**. Gudesen specifically discloses that the manufacturing step may be summed up as comprising **depositing x electrodes 4 on a substrate, applying a global isolating layer 6, applying a global semiconductor layer 9 (which is the memory material) thereabove, and depositing y electrodes 2 on top of the substrate**. Thereafter, the substrates 1 and 3, the electrodes 4 and 2, the isolating layer 6, and the memory material 9 are joined into a sandwich structure. *See Gudesen, page 13, lines*

7-13; Figures 4a - 4c. As such, the ROM device of Gudesen is a **rigid structure** and the x and y sets of electrodes are on **separate layers** with no possibility of interlacing between the respective sets of electrodes.

Clearly, if the sets of x and y sets of electrodes are on their own **separate layers**, then Gudesen **cannot** teach the feature of weaving, knitting, crocheting, knotting, or stitching. It is also clear that **if the structure is rigid, Gudesen <u>cannot suggest</u>** the same feature. Simply put, the ROM device according to Gudesen bears no resemblance to the claimed embodiments of the present invention. *Compare e.g. Figure 3a of Gudesen with Figures 1a-3d of the present disclosure.*

In sum, the Examiner failed to establish a *prima facie* case obviousness with regard to independent claim 35.

2. <u>Examiner's Mischaracterizations - Independent Claim</u>

The Final Office Action is replete with Examiner's mischaracterizations in his discussion regarding independent claim 35.

Example 1: The Examiner mischaracterized the meaning of the term "flexible" as used in Gudesen. More specifically, the Examiner stated that Gudesen discloses flexible technical solutions and reduced cost and cited page 4, lines 3-8 of Gudesen for support. *See Final Office Action, page 4, line 22 - page 5, line 3.*

It appears that the Examiner's logic is as follows. The term "flexible" to refers to physical flexibility so that Gudesen's device can be made to be physically flexible. If Gudesen's device can be physically flexible, then the device "could" be physically arranged in weaving, knitting, crocheting, knotting, or stitching manner.

The Examiner's interpretation is wholly without merit. More specifically, the cited portion of Gudesen states:

> The use of organic materials, for instance polymer materials, which realized in thin film technology may be used both in conductors, isolators, and semiconductors materials, something which supposedly shall provide more **flexible technical solutions** and especially a much reduced cost than would be the case when using crystalline inorganic semiconductors. *Emphasis added.*

It is abundantly clear that the term "flexible" in the above context refers to "choice" of technical solutions available. In other words, the term "flexible" is closer to the

meaning of term "options". **It has nothing to do with physical flexibility**. Indeed, as noted above, Gudesen clearly teaches a rigid structure, which is quite the opposite.

The following should also be noted. The x and y sets of electrodes 4 and 2 are provided as metallic conductors on either side of the memory layer. Any attempts to produce the pattern as claimed, that is by weaving, knitting, etc., would result in physically breaking the device and/or would lead to short-circuiting **making Gudesen's device entirely unsatisfactory for its intended purpose**.

Gudesen does disclose that the device may be supported by rigid or flexible backplane. *See Gudesen, page 10, lines 31-33*. However, this **cannot** be in any manner be interpreted to indicate that the x and y sets of electrodes 4 and 2 themselves are physically flexible.

Example 2: The Examiner mischaracterized the meaning of the term "patching" as used in Gudesen. More specifically, the Examiner asserted that Gudesen teaches a web of circuitry where the elements "are arranged in said predetermined circuit pattern by integrating said elements using patching" and referred to

Figures 3a and page 10, line 18 - page 11, line 12 of Gudesen for alleged support. *See Final Office Action, page 4, lines 11-15.* It appears that the Examiner has associated the term "patching" as used in the field of handcrafts as in sewing together pieces of cloths.

Like the Examiner's interpretation of the term "flexible", the Examiner's interpretation of the term "patching" is wholly without merit. Patching, as used in Gudesen, merely refers to providing an insulation in the memory cells 5 so that the desired binary logic values may be written into the ROM. *See Figures 3a - 6b.* The Examiner has failed to establish a *prima facie* that patching, as used in Gudesen, may be interpreted to be equivalent to weaving, crocheting, etc.

<u>Example 3</u>: The Examiner mischaracterized the information intended to be conveyed by the figures of the present disclosure and Gudesen. More specifically, the Examiner asserted that device as shown in figures 3a and 7 of Gudesen are analogous to the invention as claimed and as depicted in Figures 7-9b and 9d of the present disclosure. *See Final Office Action,*

page 4, second paragraph. Yet again, the Examiner's assertion is without merit.

First, the Examiner merely declared that the referred to figures of Gudesen and the present disclosure are analogous, but failed to provide any explanation as to how he arrived at such a conclusion. Indeed, after comparing the figures, Applicants found it impossible to arrive at any logical reasoning that can lead to such a conclusion.

For instance, figure 3a of Gudesen shows that the ROM device is a rigid structure where memory material 9 is sandwiched between a layer of x electrodes 4 and a layer of y electrodes 2. Compared to the claimed embodiments (*see e.g. Figures 2a-2e, 3a-3d, 8a-8b, 9d, etc. of the present disclosure*), it is abundantly clear that Gudesen's ROM device and the invention as claimed are **not** analogous.

Also, figure 7 of Gudesen shows that multiple ROM devices may be provided on a substrate 1 and driver and control circuits 13 may be integrated. *See Gudesen, page 15, lines 10-16*. Again, when compared to the figures of the present disclosure, it is abundantly clear that Gudesen's ROM device and the invention as claimed are **not** analogous.

The Examiner may have relied upon figure 2 of Gudesen. If so, the Examiner's logic appears to be as follows. Figure 2 of Gudesen appears to be similar to Figures 9a and 9b of the present disclosure. Because the figures are similar, Gudesen's device and the claimed invention must be analogous.

This is a misinterpretation of the information intended to be conveyed by Figures 9a and 9b of the present disclosure and figure 2 of Gudesen. These figures are electrical circuit representation of generic matrix array types of devices, where specific addresses in the array are located in a crosspoint matrix fashion. These figures cannot be in any manner be relied upon to reflect the true nature of physical realization of the devices. Certainly, these figures cannot be relied upon to teach or suggest weaving, knitting, crocheting, etc. Thus, the Examiner's reliance is completely misplaced.

In summary, Gudesen merely teaches a ROM device that is mask-programmed during the manufacturing process. Standard photolithographic techniques are used to build the device as embodied in Gudesen. As such, Gudesen's teachings is wholly non-analogous to the claimed inventions.

3. Examiner's Mischaracterizations - Dependent Claims of Group 1

For at least due to their dependency on independent claim 35, the dependent claims of Group 1 (2-7, 9-20, 30, and 36-42) are also distinguishable over Gudesen. In addition, the Final Office Action, with respect to the dependent claims of Group 1 claims, is replete with assertions that are without merit.

Example 4: The Examiner erred when he asserted that Gudesen teaches a two-dimensional fabric-like structure. The Examiner relied upon Gudesen's figure 3a, items 2-7 for support. *See Final Office Action, page 5, lines 4-5.*

Contrary to the Examiner's assertion, the ROM device of Gudesen is a sandwich structure with x and y sets of electrodes 4 and 2 formed on a layer-by-layer basis and is **non-woven**. The Examiner has failed to establish a *prima facie* case that Gudesen teaches or suggest a two-dimensional fabric-like structure. *See e.g. claims 2 and 3.*

Example 5: The Examiner erred when he asserted that the top and bottom substrates 3 and 1 are equivalent to a shielding

or cladding of the elements as claimed. *See Final Office Action, page 5, lines 12-13.* The Examiner also asserted that the substrate 3 is removed to expose the x electrode 4 to thereby teach the requirement of active regions being exposed by removing the shielding. *See Final Office Action, page 5, lines 13-15.*

However, it is clear that the figures of Gudesen only shows examples where the substrates 3 and 1 **entirely cover** the electrodes 4 and 2. Further, Gudesen simply states that the electrodes 4 and 2 are deposited on substrates 3 and 1. *See e.g. Gudesen, page 13, lines 7-13.* Gudesen is **entirely silent** regarding whether any portion of the substrates 1 and/or 3 is removed to expose the electrodes 4 and/or 2, and the Examiner has not provided any logical line of reasoning for such an interpretation. Therefore, Examiner has failed to establish a *prima facie* case that Gudesen teaches or suggests the feature of active regions being exposed by removing the shielding. *See e.g. claims 12 and 14.*

Example 6: The Examiner erred when he asserted that Gudesen teaches that the semiconducting junction 5 is formed

spontaneously upon contact. The Examiner relied upon Gudesen, page 11, lines 13-18 for support. *Emphasis added; See Final Office Action, page 6, lines 4-5.*

The region 5, as disclosed in Gudesen, is the memory cell 5 formed in a region at crossings between electrodes 2 and 4. *See e.g. Gudesen, Figures 3a - 3c.* Gudesen discloses that binary logic values of the memory cells **is manufactured** into the ROM. In other words, the binary values are formed either by **purposefully** enabling electrical connection between the x and y electrode at the crossing or by **purposefully** insulating so that the electrical connection does not occur. Therefore, the Examiner has failed to establish a *prima facie* case that Gudesen teaches or suggests forming a semiconducting junction spontaneously upon contact of elements. *See e.g. claim 16.*

Example 7: The Examiner erred when he asserted that the Gudesen teaches an element being composed of a transparent material. The Examiner relied upon Gudesen, page 11, lines 25-35 for support. *See Final Office Action, page 6, lines 21-22.*

The Examiner asserted that x and y electrodes 4 and 2 are equivalent to the elements as claimed. However, as clearly

demonstrated previously, the electrodes are simply electrical conductors. Gudesen is completely silent regarding their optical characteristics.

The specific portion of Gudesen relied upon by the Examiner indicates that **the substrate 3** may be transparent, but **not** the electrodes 2 and/or 4. As noted above, the Examiner equated the substrate to be equivalent to shielding or cladding (which in itself is an unreasonable interpretation). Therefore, the Examiner has failed to establish a *prima facie* case that Gudesen teaches or suggests a transparent element. *See e.g. claim 38.*

Example 8: The Examiner erred when he asserted that the Gudesen teaches an intersection of absorbing electrical or optical energy. The Examiner relied upon Gudesen's abstract; page 4, lines 12-30; and page 9, lines 30-36 for support. *See Final Office Action, page 7, lines 2-3.*

Closer observation of the relied upon portions indicate that Gudesen is merely explaining the ROM device and its method of operation. For instance, Gudesen's abstract merely describes the features of a passive-matrix ROM device and how data may be stored and read. Page 4, lines 12-30 of Gudesen merely describe

the structures involved in encoding binary logic values in the ROM devices (diode junction for first logic state, isolating material for second logic state) and possibilities regarding multi-valued logic states. Page 9, lines 30-36 merely discusses some ways in which cross-talk may be avoided.

However, there is simply **no discussion** regarding absorption of any type of energy at all. Also, the Examiner did not provide any line of reasoning as to how the relied upon portions may be interpreted to teach or suggest absorption of electrical or optical energy. Therefore, the Examiner has failed to establish a *prima facie* case that Gudesen teaches or suggests absorption of electrical or optical energy. *See e.g. claim 41.*

<u>Example 9</u>: The Examiner erred when he asserted that the Gudesen teaches an intersection of absorbing chemical or mechanical energy. The Examiner relied upon Gudesen's abstract; page 4, lines 12-30; and page 9, lines 30-36 for support. *See Final Office Action, page 7, lines 4-5.*

As noted above, there is simply no discussion regarding absorption of any type of energy at all and the Examiner did not provide any logical line of reasoning for such an interpretation.

Therefore, the Examiner has failed to establish a *prima facie* case that Gudesen teaches or suggests absorption of chemical or mechanical energy. *See e.g. claim 42.*

B. <u>**Group 2 Claims**</u>

1. Gudesen Cannot Be Relied Upon To Teach Or Suggest Features of the Dependent Claims of Group 2

The Examiner rejected the Group 2 claims 8 and 21-29 based on a combination of Gudesen and Lebby. *See Final Office Action, page 7, lines 9-10.* As clearly demonstrated above, Gudesen cannot be relied upon to reject independent claim 35. The Examiner did not, and indeed cannot, rely on Lebby to correct for the numerous deficiencies of Gudesen. Thus, independent claim 35 is distinguishable over the combination of Gudesen and Lebby.

For at least due to their dependency on independent claim 35, the Group 2 claims are also distinguishable over the combination of Gudesen and Lebby.

2. Gudesen and Lebby May Not Be Combined

Gudesen and Lebby may not be combined for the simple reason that they are not analogous. Gudesen and Lebby are inventions of completely different technologies and of completely different physical scale.

Gudesen is directed to a ROM device manufactured using standard lithographic techniques. Presumably, the x and y sets of electrodes are on the physical scale of microns and nanometers.

On the other hand, Lebby is directed toward textile fabrics for clothing that incorporate optical fibers so that the clothing may have some functionality. *See Lebby, column 1, lines 6-9; Figure 4.* The textile fabric are visible to the naked eye, i.e. the physical scale is incomparable to the ROM device of Gudesen.

The Examiner asserted as motivation to combine the textile fabric of Lebby with the ROM device of Gudesen as "to produce a conventional web circuitry ... since the resultant optoelectronic system would provide control circuits being integrated with substrates realized in a semiconductor technology." *See Final Office Action, page 8, lines 15-21.*

Is the Examiner asserting that substrates as taught in Gudesen can be expanded to the size of the textile fabric as taught in Lebby? Applicants simply fail to understand how the teachings of Lebby - which is merely a clothing textile with optical fibers incorporated therein - may be used to modify the ROM device of Gudesen at all.

Also, the Examiner asserted that the electrically conductive fiber 22 and the holographic optical fibers 24 of Figure 3 of Lebby are equivalent to the elements as claimed and relied upon column 4, lines 21-48 of Lebby. *See Final Office Action, page 8, lines 11-13.* This is erroneous.

Closer reading of Lebby reveals the following - **there is <u>no</u> interaction** between the electrically conductive fiber 22 and the optical fiber 24. At best, Lebby teaches that the fibers 22 and 24 are laid in a physically orthogonal manner and thus, physical crossings may occur. *See Lebby, Figure 3.* However, Lebby states that the electrically conductive fiber 22 is similar to the electrically conductive fiber 12 of the first embodiment as shown in Figure 1. *See Lebby, column 4, line 29-32.* The electrically conductive fiber 12, and therefore the fiber 22, is **completely insulated by the insulating overcoating layer 18.**

See Lebby, Figure 2; column 3, line 65 - column 4, line 1. The layer 18 prevents any type of interaction occurring between the fibers 22 and 24. Therefore, fibers 22 and 24 cannot be equivalent to the elements as claimed.

Since fibers 22 and 24 cannot be equivalent to the elements, the teachings of Lebby simply cannot be combined with the teachings of Gudesen in the manner asserted by the Examiner. Therefore, the Examiner has failed to establish a *prima facie* case of obviousness.

3. Examiner's Mischaracterizations - Claims of Group 2

The Final Office Action, with respect to the Group 2 claims, is replete with assertions that are without merit.

Example 10: The Examiner erred when he asserted that Gudesen teaches the feature wherein at least one of the elements is a signal transmission line that carries the predetermined intensities and frequencies to predetermined location. The Examiner relied upon page 9, line 30 - page 10, line 3+ and

abstract of Gudesen for support. *See Final Office Action, page 7, lines 11-14.*

As noted before, Gudesen's abstract merely describes the features of a passive-matrix ROM device and the ways in which data may be stored and read. Page 9, line 30 - page 10, line 3 merely describes a way to avoid crosstalk.

There is simply **no discussion** of the feature as recited and the Examiner did not provide any line of reasoning as to how the relied upon portions may be interpreted as such. Therefore, the Examiner has failed to establish a *prima facie* case that Gudesen teaches or suggests a signal transmission line that carries the predetermined intensities and frequencies to predetermined location. *See e.g. claims 21 and 22.*

<u>Example 11</u>: The Examiner asserted that the Gudesen teaches an intersection of emitting or absorbing electrical or optical energy and relied upon Gudesen's abstract; page 4, lines 12-30; and page 9, lines 30-36 for support. *See Final Office Action, page 7, lines 14-18.* This has been clearly demonstrated to be erroneous (see Example 8 above).

Example 12: The Examiner erred when asserted that the Gudesen teaches active regions of the elements being either a loop-like portion of an element or an end. The Examiner relied upon Gudesen's Figure 3, items 2/7 for support. *See Final Office Action, page 7, lines 21-22.*

It is noted that item 7 is merely an insulating patch which prevents electrical communication between electrodes 2 and 4. The Examiner has provided no logical line of reasoning to interpret the items 2 and 7 of Gudesen as asserted. Therefore, the Examiner has failed to establish a *prima facie* case that Gudesen teaches or suggests active regions of the elements being either a loop-like portion of an element or an end. *See e.g. claim 29.*

Example 13: The Examiner erred when he asserted that the Gudesen teaches that the web of circuitry can be used for forming of films/motion pictures. The Examiner relied upon page 16, last paragraph of Gudesen for support. *See Final Office Action, page 8, lines 21-22.*

Again, the Examiner has wholly mischaracterized the teachings of Gudesen. This particular relied upon portion

merely explains that data of the ROM may be written at manufacturing time. Therefore, it can be used to mass manufacture a large number ROMs **where the data is the same for all ROMS** such as music data and film data. More specifically, the relied upon portion recites, in part:

> Processes of this kind may easily be implemented for **manufacturing of large series of read-only memories with the same source information**, for instance program material for music or films. *Emphasis added.*

Applicants fail to understand how this portion of Gudesen may be interpreted in the manner asserted by the Examiner. Clearly, a ROM **cannot** be used to form films and/or motion films.

C. **Group 3 Claims - Gudesen and Wiener Cannot Be Combined**

The Examiner rejected the Group 3 claims 31 and 32 based on a combination of Gudesen and Wiener. *See Final Office Action, page 9, lines 1-2.* The Examiner appears to be asserting that the so called web of circuitry as shown in Wiener may be used to modify Gudesen's device so as to teach or suggest the feature of including physical or chemical sensors.

This combination suffers from at least the following. First, similar to the situation discussed above with respect to Lebby, Gudesen and Wiener may not be combined for the simple

reason that they are not analogous. Gudesen and Wiener are inventions of completely different technologies and of completely different physical scale.

Wiener is directed incorporating optical fibers into textile fabrics so that the "smart" skins may be provided. *See Wiener, column 1, lines 17-22.* The textile fabric are visible to the naked eye, i.e. the physical scale is incomparable to the ROM device of Gudesen. This is to be contrasted with Gudesen's devices manufactured at micron/nanometer scale.

The Examiner asserted as motivation to combine the textile fabric of Wiener with the ROM device of Gudesen as "to produce a conventional web circuitry … since the resultant optoelectronic system would provide control circuits being integrated with substrates realized in a semiconductor technology." *See Final Office Action, page 9, lines 12-15.*

Again, this begs the question - is the Examiner asserting that substrates as taught in Gudesen can be expanded to the size of the textile fabric as taught in Wiener? And again, applicants simply fail to understand how the teachings of Wiener - which is merely a clothing textile with optical fibers

incorporated therein - may be used to modify the ROM device of Gudesen at all.

In addition, it appears that the Examiner is asserting that the optical fibers 12 (*see Wiener, figure* 7) are equivalent to the elements as claimed. **This is clearly without merit**. Wiener clearly indicates that the supporting strands of the fabric are woven in warp and woof directions. For example, in figure 1, warp strands 10A-10D are woven with woof strands 11A-11D. It is important to note that the warp and woof strands are for **physical support only** and do not provide any optical and/or electrical functions.

Within the supporting strands, optical fibers 12 may be incorporated within the channels of the supporting strands. *See Wiener, column 2, lines 36-39*. Wiener further states that the optical fibers 12 "are positioned in zero warp and supported in the channels **<u>without</u> cross-overs or micro-bends.**" *Emphasis added; See Wiener, column 2, lines 39-42*. In all embodiments of Wiener, there are no examples where optical fibers are laid in any orthogonal manner to cross each other. Indeed, **Wiener specifically teaches away from** this feature.

For at least these reasons, Gudesen and Wiener may not be combined as the Examiner asserted. Therefore, the Examiner has failed to establish a *prima facie* case of obviousness.

IX. Conclusion

For the reasons specifically set forth above, the outstanding rejections set forth in the Final Office Action should be REVERSED.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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APPENDIX

The Appealed Claims and Figures

2. The apparatus according to claim **35**, wherein the pattern is a two-dimensional fabric-like structure.

3. The apparatus according to claim **35**, wherein the pattern is a three-dimensional fabric-like structure.

4. The apparatus according to claim **35**, wherein the elements are arranged such that the positions of the ends of the elements define a spatial grid.

5. The apparatus according to claim **35**, wherein some elements are twisted pair transmission lines.

6. The apparatus according to claim **35**, wherein some elements are transmission lines that are coaxial cables.

7. The apparatus according to claim **35**, wherein some elements are stripline transmission lines.

8. The apparatus according to claim **35**, wherein some elements are optical fiber transmission lines.

9. The apparatus according to claim **35**, wherein the elements have active regions that are defined by exposing portions of the elements to the encompassing environment.

10. The apparatus according to claim **35**, wherein said element has an active region that is extended lengthwise therein.

11. The apparatus according to claim **35**, wherein said element has an active region that corresponds to an end thereof.

12. The apparatus according to claim **35**, wherein some of the elements are provided with a protective shielding or cladding, the active regions in these elements being provided by removing the shielding or cladding at selected portions thereof.

13. The apparatus according to claim **35**, wherein the active regions of the elements are provided in selected portions of the

elements exposed in the surface of the fabric-like structure or protruding therefrom at selected locations thereof.

14. The apparatus according to claim **35**, wherein the active regions of the elements are defined by exposing portions thereof to spatially selective physical or chemical influences.

15. The apparatus according to claim **14**, having at least two transmission lines wherein at least one transmission line is a conductor embedded in an exterior cladding composed of an organic semiconducting material, where active regions are defined by contact between transmission lines, and where semiconducting junctions are formed at the contact points of said intersections.

16. The apparatus according to claim **15**, wherein the semiconducting junctions are formed spontaneously upon contact.

17. The apparatus according to claim **15**, wherein at least one semiconducting junction is a diode junction.

18. The apparatus according to claim **15**, wherein the organic semiconducting material is a semiconducting polymer.

19. The apparatus according to claim **35**, wherein some of the elements, having characteristic lengths, are shielded over a portion of the lengths against exchange of energy between elements or the exterior surroundings, where one or more unshielded portions are adapted to enable exchange of energy through the unshielded portions.

20. The apparatus according to claim **19**, wherein the unshielded portions of the elements are located at the intersections thereof.

21. The apparatus according to claim **19**, wherein the apparatus is a two- or three-dimensional optoelectronic display where the unshielded portions emit light at predetermined intensities, frequencies, and locations.

22. The apparatus according to claim **21**, wherein at least one of the elements is a signal transmission line that carries the

predetermined intensities and frequencies to predetermined locations in the pattern.

23. The apparatus according to claim **22**, wherein the display is a two-dimensional display, wherein the elements form a two-dimensional array of equally spaced elements.

24. The apparatus according to claim **23**, wherein the intersections are adapted for absorption or emission of electrical or optical energy.

25. The apparatus according to claim **24**, wherein a portion of at least one element in an intersection is a pixel of the display.

26. The apparatus according to claim **22**, wherein the display is a three-dimensional display, wherein the elements are provided in a three-dimensional array of equally spaced elements.

27. The apparatus according to claim **26**, wherein the elements intersect in a spatial regular pattern or grid, where some elements

in the pattern are adapted for emitting or absorbing electrical or optical energy.

28. The apparatus according to claim **26**, wherein a portion of at least one element in an intersection is a pixel of the display.

29. The apparatus according to claim **26**, wherein active regions of the elements are provided in selected portions of the element exposed in the surface of the fabric-like structure or protruding therefrom at selected locations thereof, where the active regions are pixels in the display, said active regions being either a loop-like portion of an element or an end.

30. The apparatus according to claim **35**, wherein the pattern contains elements that are discrete electronic, optoelectronic or optical devices or combinations thereof.

31. The apparatus according to claim **30**, wherein one or more of the discrete devices are physical or chemical sensors connected to at least one of the elements.

32. The apparatus according to claim **35**, wherein one or more of the elements are a physical or chemical sensors.

35. A web of circuitry comprising:

at least two circuit elements, each having ends;

at least one physical intersection of said elements, where the intersection does not occur at the ends of said elements; and

a predetermined circuit pattern, wherein said elements are arranged in multiple-dimensions according to said pattern, where the intersection is a point of communication between elements, where the intersections and varying properties of the elements form active regions, where the active regions are associated with circuitry in the pattern, where at least one element is a transmission line or an isolator and

wherein said elements are arranged in said predetermined circuit pattern by integrating said elements using weaving, knitting, crocheting, knotting, or stitching.

36. The apparatus of claim **35**, wherein at least one intersection and associated elements form an active region where the

physical properties of the elements result in the absorption or emission of energy in the region.

37. The apparatus of claim **35**, wherein at least one intersection allows electronic communication between the elements associated with the intersection.

38. The apparatus of claim **35**, wherein one element is composed of a transparent material.

39. The apparatus of claim **35**, wherein one element is composed of a conducting material.

40. The apparatus of claim **35**, wherein one element is composed of a semi-conducting material.

41. The apparatus of claim **36**, wherein the intersection absorbs electrical or optical energy.

42. The apparatus of claim **36**, wherein the intersection absorbs chemical or mechanical energy.

55. A web of circuitry, comprising:

a first plurality of circuit elements extending in a first direction; and

a second plurality of circuit elements extending in a second direction, the second direction being non-parallel to the first direction, wherein

the second plurality of circuit elements are interlaced with the first plurality of circuit elements,

at least one intersection between the first and second plurality of circuit elements forms an active region associated with circuitry, and

at least one circuit element is a transmission line.

56. The web of circuitry of claim **55**, wherein the first and second plurality of circuit elements form a fabric-like structure.